DEPARTMENT OF NATIONAL DEFENCE
CANADA

OPERATIONAL RESEARCH DIVISION

DIRECTORATE OF OPERATIONAL RESEARCH (JOINT & LAND)

DIRECTORATE RESEARCH NOTE 9905

EXPERIMENTATION AND INNOVATION IN THE CANADIAN FORCES:
Some Preliminary Considerations

BY

DR SCOT ROBERTSON

JUNE 1999

OTTAWA, CANADA

National Defence Défense nationale

102-02421/

OPERATIONAL RESEARCH DIVISION

CATEGORIES OF PUBLICATION

ORD Reports are the most authoritative and most carefully considered publications of the DGOR scientific community. They normally embody the results of major research activities or are significant works of lasting value or provide a comprehensive view on major defence research initiatives. ORD Reports are approved personally by DGOR, and are subject to peer review.

ORD Project Reports record the analysis and results of studies conducted for specific sponsors. This Category is the main vehicle to report completed research to the sponsors and may also describe a significant milestone in ongoing work. They are approved by DGOR and are subject to peer review. They are released initially to sponsors and may, with sponsor approval, be released to other agencies having an interest in the material.

Directorate Research Notes are issued by directorates. They are intended to outline, develop or document proposals, ideas, analysis or models which do not warrant more formal publication. They may record development work done in support of sponsored projects which could be applied elsewhere in the future. As such they help serve as the corporate scientific memory of the directorates.

ORD Journal Reprints provide readily available copies of articles published with DGOR approval, by OR researchers in learned journals, open technical publications, proceedings, etc.

ORD Contractor Reports document research done under contract of DGOR agencies by industrial concerns, universities, consultants, other government departments or agencies, etc. The scientific content is the responsibility of the originator but has been reviewed by the scientific authority for the contract and approved for release by DGOR.

DEPARTMENT OF NATIONAL DEFENCE

CANADA

OPERATIONAL RESEARCH DIVISION

DIRECTORATE OF OPERATIONAL RESEARCH (JOINT & LAND)

DIRECTORATE RESEARCH NOTE RN 9905

EXPERIMENTATION AND INNOVATION IN THE CANADIAN FORCES: Some Preliminary Considerations

by

Dr Scot Robertson

Recommended by: _____
G.L Christopher
Leader, SPORT

Approved by: _____
G.L Ilafond
DOR (J&L)

Directorate Research Notes are written to document material which does not warrant or require more formal publication. The contents do not necessarily reflect the views of ORD or the Canadian Department of National Defence.

OTTAWA, ONTARIO JUNE 1999

ABSTRACT

This Research Note provides some preliminary thoughts on the possible requirement for an experimentation and innovation capability within the Canadian Forces. While the Maritime, Land and Air communities have, to one extent or another, their own experimentation and innovation facilities, it is clear that a Canadian Forces *purple* or *joint* capability does not exist. The question remains, then, whether and/or how a CF experimentation and innovation capability can be created. To address this, it is first necessary to think about the problems attached to military experimentation and innovation.

TABLE OF CONTENTS

PAGE

ABSTRACT i

TABLE OF CONTENTS..... ii

INTRODUCTION 1

EXPERIMENTATION AND INNOVATION 4

MILITARY EXPERIMENTATION 6

A Concept for CF Experimentation 8
The Aim of Experimentation in the CF 9

SUMMARY 13

EXPERIMENTATION AND INNOVATION IN THE CANADIAN FORCES:

Some Preliminary Considerations

The strategy and operations of any war can be understood only in the light of conditions of the ten or twenty years before its beginning. Technology, organization, doctrine, training, command and staff appointments -- all the essentials of action in war -- are put in place and developed in peacetime. The testing experience of combat will bring about change, but prewar elements continue to affect many events throughout the longest of conflicts.[1]

[The military] is like a sailor navigating by dead reckoning. You have left the terra firma of the last war and are extrapolating from the experiences of that war. The greater the distance from the last war, the greater become the chances of error in this extrapolation. Occasionally there is a break in the clouds: a small-scale conflict occurs somewhere and gives you a "fix" by showing whether certain weapons and techniques are effective or not: but it is always a doubtful mix .... For the most part you have to sail on in a fog of peace until at the last moment. Then, probably when it is too late, the clouds lift and there is land immediately ahead; breakers, probably, and rocks. Then you find out rather late in the day whether your calculations have been right or not.[2]

INTRODUCTION

1. From Vancouver to Vladivostock, and from Tallin to Tirana, military establishments are wrestling with complex factors that will influence the way armed forces organise, plan, and equip to fight future battles. This planning environment is shaped by two competing, some might even say contradictory, considerations. The first is the aftermath of the Cold War, which brought with it an understandable desire to reduce the expense associated with large and technologically sophisticated armed forces.

---

1 Foreword by Peter Paret, in Harold R. Winton, To Change an Army: General Sir John Burnett-Stuart and British Armoured Doctrine, 1927-1938, (Lawrence, Kansas: University Press of Kansas, 1988) p. vii.

2 Michael Howard, "Military Science in an Age of Peace", Journal of the Royal United Services Institute, No. 119, March 1974, p. 4.

This desire is not new, or even remarkable. It has been a hallmark of the aftermath of most modern conflicts. The second shaping consideration arose largely from the conduct of the Persian Gulf War. Military establishments around the world watched in awe the performance of the coalition force. That performance was characterised by a degree of technological sophistication, married to doctrinal and operational concepts that resulted in a new vision of what high-intensity, fast paced operations of the future might entail.

2. Across the Western defence community and beyond, we are witnessing a vigorous effort to master the problems of reduction in force structure, and at the same time ensure that armed forces make the best use of technological and doctrinal changes brought to the fore in the Persian Gulf War. In part, this effort is driven, at least in the West, by the prospects for what has come to be termed a Revolution in Military Affairs (RMA). A Revolution in Military Affairs has been defined as "a major change in the nature of warfare brought about by the innovative application of technologies which, combined with dramatic changes in military doctrine, and organisational concepts, fundamentally alters the character and conduct of operations."[3] So far, however, the discussion of the RMA has not reached definitive conclusions. As one commentator noted recently, "the exchanges [over the RMA] have become increasingly intense. The two positions, pitting advocates against doubting Thomas's, contrast a revolutionary interpretation as opposed to an evolutionary one."[4] Undoubtedly, this debate will continue in the years to come.[5]

---

[3] This definition, which has been developed by the Office of Net Assessment, US Department of Defense, is reproduced in Earl H Tilford Jr, "The Revolution in Military Affairs: Prospects and Cautions" Strategic Studies Institute, United States Army War College, Carlisle Barracks, June 1995. p. 1.

[4] Jacob W. Kipp, "The Revolution in Military Affairs and its Interpreters: Implications for National and International Security Policy", unpublished paper presented at a joint conference of the Foreign Military Studies Office and the Academy of State Management of the President of the Russian Federation, September 1995, Moscow Russia.. p.1.

[5] For a full discussion of the notion of a Revolution in Military Affairs, see several of the papers presented at the Fifth Annual Conference on Strategy held at the US Army War College in April 1994. In particular, Paul Bracken and Raoul Henri Alcalá, "Whither the RMA: Two Perspectives on Tomorrow's Army", (Carlisle Barracks PA:, US Army War College, Strategic Studies Institute, July 1994.); Jeffrey R Cooper, "Another View of the Revolution in Military Affairs", (Carlisle Barracks PA:, US Army War College, Strategic Studies Institute, July 1994.); David Jablonsky, "The Owl of Minerva Flies at Twilight: Doctrinal Change and Continuity and the Revolution in Military Affairs", Professional Readings in Military Strategy, No. 10 , (Carlisle Barracks PA:, US Army War College, Strategic Studies Institute, May 1994.); and, Michael J. Mazarr, "The Revolution in Military Affairs: A Framework for Defense Planning",

3. Given the debate's ongoing nature, and the uncertainty regarding its resolution, we would be wise to pause and consider the factors that will drive the debate, and that will come together to and influence its outcome. For this purpose, it may be instructive to draw on historical experience, where the record is at least somewhat clearer. Such a use of history, or perhaps misuse of history, may be frowned upon in some quarters. To a certain extent, this is a valid criticism. As Sir Michael Howard observed: "It is safer to start with the assumption that history, whatever its value in educating the judgement, teaches no 'lessons', and the professional historians will be as sceptical of those who claim that it does as professional doctors are of their colleagues who peddle patent medicines guaranteeing instant cures."[6]

4. While this is a sound cautionary prescription, Sir Michael recognised that in the military context, there are unique circumstances in which historical study can be not only helpful, but perhaps indispensable. He characterised the situation confronting the military profession as one in which "there are two great difficulties with which the professional soldier, sailor, or airman has to contend in equipping himself as a commander. First, his profession is almos[illegible]que in that he may only have to exercise it once in a lifetime, if indeed that often. Secondly the complex problem of running a [military service] at all is liable to occupy his mind and skill so completely that it is easy to forget what it is being run *for*."[7]

5. Faced with this situation, it is difficult for armed services to consider long-term future requirements removed from the press of day to day problems. In the absence of the opportunity to hone skills and judgement on the battlefield, military services need to look to their equivalent of the laboratory, which in some cases is derived from the body of past experience, that is to say, history. The study of history can suggest relevant

---

(Carlisle Barracks PA:, US Army War College, Strategic Studies Institute, June 1994.)

[6] Sir Michael Howard, "The Lessons of History", in The Lessons of History, (New Haven CT.: Yale University Press, 1991.) p. 11.

[7] Sir Michael Howard, "The Use and Abuse of Military History", Journal of the Royal United Services Institute, Vol 107, February 1962, p. 6.

questions to ask, enumerate certain principles worthy of further investigation, and perhaps most importantly, sharpen the ability to make judgements regarding complicated and incomplete information.

EXPERIMENTATION AND INNOVATION

6. In a recent study on military innovation during the interwar period, Williamson Murray noted: "To understand innovation ... one must not lose track of the fact that the interplay among human factors, uncertain knowledge, misreadings of the past, political and strategic parameters placed innovation on a complex playing field in which not only were the players uncertain of the future, but they were often more concerned with immediate problems than with long-range changes."[8] This observation is a trenchant statement of the problems confronting military planners. It is often difficult enough to sustain the current force, let alone attempt to envisage long-term influences that may affect the future nature of war through technological, doctrinal or organisational developments. The problem is, as Murray reflected, a case of military planners endeavouring to prepare for a war that "will occur at some indeterminate point in the future against an unidentified opponent, in political conditions that cannot be accurately predicted and in an arena of brutality and violence which one cannot replicate."[9]

7. Faced with this, what factors and influences are central to the process of translating a notion of future [perhaps revolutionary] developments into a capable force structure in the face of external and internal constraints? Clearly, experimentation plays a key, if not critical role in this endeavour. The degree to which one is successful is, to a certain extent, dependent upon developing a rigorous programme of experimentation. That being the case, it is important to develop an overarching approach to guide the process of experimenting with innovative force development concepts.

---

8 Williamson Murray, "Innovation: Past and Future", in Williamson Murray and Allan R Millett (eds.) Military Innovation in the Interwar Period, (Cambridge: Cambridge University Press, 1996.) pp. 303-04.

9 Murray, "Innovation: Past and Future", p. 301.

8. While the Canadian Forces have, over time, carried out a programme of experimentation, this has by and large focussed on individual systems and the means of integrating these weapons systems into existing structures and doctrine. The CF has had less experience with higher level experimentation. Moreover, past experimentation has often, if not exclusively, been carried out in the context of the Cold War. Events of the past decade have altered that strategic context, perhaps calling into question much of the body of experience arising from those often discrete experiments. In addition, for most of the decade of the1990s, the emphasis has been on adjusting and adapting to the new yet still evolving strategic context, which has for the most part meant carrying out a programme of reduction and rationalisation. Significant developments in military arts and sciences, while not unnoticed, have taken something of a back seat to the process of reduction and rationalisation.

9. At this juncture, however, there are indications that a corner has been turned. A number of factors suggest that the CF has reached a point where it can turn its attention from matters of the moment, to longer term issues that will affect its future. A major indication is the initiative to prepare STRATEGY 2020. The aim of the STRATEGY 2020 exercise is to develop a roadmap to meet the imperatives of the 2020 timeframe. After some considerable effort, one of the more significant outcomes of the STRATEGY 2020 process was to identify the need to produce an innovative, transformed force model for the 2020 timeframe. While the specifics of this are not clear, in fact they cannot be clear at this early stage, the objective has been set. It remains to be seen what the result of the exercise will be ultimately. To some extent, the STRATEGY 2020 exercise will hinge upon the successful framing of a programme of innovation. In developing this programme experimentation will be critical.

10. Flowing from the STRATEGY 2020 initiative, there has been a nascent but still evolving effort to consider how a coherent experimentation capability could be fostered within the Canadian Forces. This initiative has gained some momentum over the past few months. The draft Defence Planning Guidance 2000 (DPG 2000) includes a

reference to the need to establish a CF experimentation capability. At this juncture, no resources have been set aside to create this capability, and departmental thinking is only in a preliminary stage. It isn't entirely clear at this point how it will go forward, but at least the ground is being prepared. It may be well to consider some of the more significant issues that will undoubtedly arise if the experimentation initiative is to move forward.

MILITARY EXPERIMENTATION

11. Before the CF leaps into experimentation, some thought should be given to exactly what is meant by it, and what it can provide as an output. The United States Atlantic Command (USACOM) defines experimentation as "*an iterative process of collecting, developing and exploring concepts to identify and recommend the best value-added solutions for changes to DOTMLP (doctrine, organisation, training, materiel, leadership and people) required to achieve significant advances in future joint operational capabilities.*"[10] If one were to deconstruct that definition carefully, there are a number of significant aspects to consider. The first is the iterative nature of the experimentation process. Second, is the emphasis on collecting, developing and exploring concepts. This is the heart of experimentation, and probably where the greatest difficulty will lie when the philosophical underpinnings of scientific enquiry come up against those of the military culture. A third aspect of this definition is the identification and recommendation of solutions.

12. Taken together, this definition is a fairly all-encompassing representation of experimentation in a general sense. However, the difficulty will be in devising a framework within which experimentation can take place, and a philosophy that should serve to guide our enquiries. For instance, experimentation depends, to a certain extent,

---

[10] USACOM has been designated as the executive agent for Joint Experimentation in the US Armed Services. In this role, CinCUSACOM is referred to as the J-9.

upon a spirit of enquiry that could, in some ways, be said to run counter to the military culture. The table below sets out some of the distinctions between the military and scientific cultures as they apply to experimentation.[11]

TABLE I

COMPARING THE SCIENTIFIC & MILITARY CULTURES

The Scientific and Military Cultures	
Scientific Culture	**Military Culture**
driven by discovery	driven by knowledge
non-hierarchical	Hierarchical
Embraces the unknown	avoids the unknown
Externally directed	internally directed
long-term orientation	short-term orientation
Outcomes are secondary	outcomes are paramount

This is not intended as a criticism of either the scientific or military cultures. It is simply a reflection of the characteristics of two different worlds driven by two different philosophies or outlooks. However, it may be important to recognise these differences when the two worlds come into contact, as will be the case when the military embarks upon a programme of experimentation.

[11] See Kenneth F McKenzie Jr., "An Ecstasy of Fumbling: Doctrine and Innovation, *Joint Force Quarterly*, Winter 1995-96, p. 63.

A Concept for CF Experimentation

13. In embarking upon a programme of experimentation, the CF should give considerable thought to an overarching concept of operations to guide its efforts. As a basic premise, CF experimentation should proceed from the general to the specific, or, put another way from the hypothetical, through the conceptual, to the detailed examination, ultimately leading to a validated idea or principle after a number of iterative examinations. There is an implied hierarchy to this. The table below depicts this implied hierarchy and suggests the nature of the activities as well as the methodologies that will predominate at the various levels.

TABLE II

NOTIONAL LEVELS OF EXPERIMENTATION ACTIVITIES

Level	*Activity*	*Methodologies*	*Examples*
Exploratory	Hypothetical	Brainstorming	Seminars
Strategic	Conceptual	Qualitative	Seminars Table top discussion
Operational	Validation	Qualitative & Quantitative	Seminars High-level simulation
Tactical	Design	Quantitative	Force design Modelling & simulation Live trials

14. At the Exploratory and Strategic levels, the preponderance of activity will be conducted at the CF level by a CF experimentation facility, although clearly the elements will have a role to play and an impact on this level of activity. At the operational level, the activity will be balanced between the CF and the environmental experimentation facilities. Finally, at the tactical level, the greatest preponderance of activity will be

borne by the elements experimentation facilities under a Joint perspective. Another way of portraying this is as a series of interlocking activities.

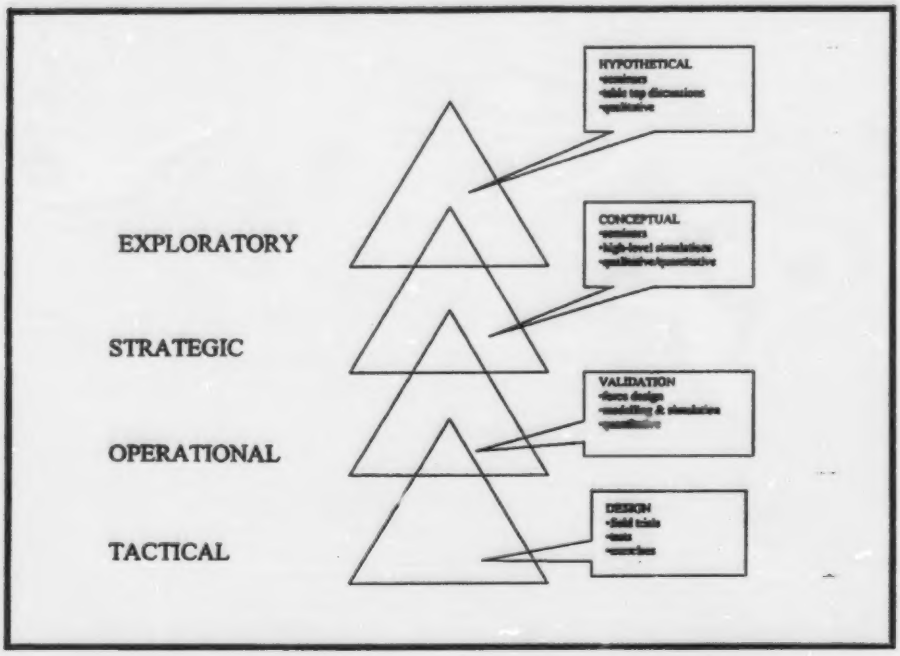

Figure 1: Hierarchy of Experimentation Activities

The Aim of Experimentation in the CF

15. The aim of conducting experiments is to generate and explore issues associated with future warfare with an eye to developing force structures. Broadly speaking these issues could be grouped into a number of general categories. One such grouping could be:

- geo-strategic;
- technology and trends;
- evolutions in military art; and

- human and organisational issues.

It is important, however, to consider these separate categories as part of a larger whole. Developments or changes in one area have the potential to affect any or all of the others. Hence, there is the potential of a spill-over or knock-on effect which must be appreciated in approaching experimentation.

16. Given the problem of considering appropriate force structures for an uncertain future, and the interconnected nature of the various elements that must be combined to generate a force model, the approach to experimentation should be both cyclical and iterative. In that sense, it would parallel the CF Future Process, which itself should be cyclical and iterative. At this point, there is **not** really a formal CF Future Process. Rather, there has been a distributed, *ad hoc* approach to future issues and considerations. In time, a formal process such as the Defence Planning and Force Development Process (DPFD) might supersede this.

17. Given the CF's lack of recent experience with high level experimentation, it may take some time to find our way. As such, it might be worth drawing on historical experience. Andrew Krepinevich alludes to several examples where experimentation was key to a process of military innovation. It may be useful to illustrate by means of historical example. One such example is the development of *Blitzkrieg*. At the end of World War I, there existed precursors of what would later be known as *Blitzkrieg*. Each of the major combatants emerged from the World War I with the same basic experience and technologies, and with largely similar organisational and doctrinal approaches. However, following the war, it was Germany that was most successful in building upon these lessons. Rather than simply grafting the lessons and technologies to the existing force model, the German's undertook a radical re-think. As *de facto* Chief of Staff of the German Army from 1919 to 1926 General Hans von Seekt embarked upon a thorough

and serious study of the "lessons" of the Great War.[12] These were embodied in the force design of the German Army that launched the devastating Blitzkrieg attacks in the opening phase of World War II.[13] In contrast, other combatants did not adapt nearly so readily. For the most part, new technology was merely grafted on to existing organisations in a piece-meal fashion. Doctrinal precepts did not evolve markedly. As such, there was an incremental increase in combat power, and an incremental change in approach, but nothing as revolutionary as that of the German *Blitzkrieg*. Krepinevich cites a number of other examples of experimentation, beginning with the railroad, rifle and telegraph in the mid 19th century, the emergence of the combination of big-gun battleships, submarines and torpedoes at the turn of the 20th century, and the development of carrier aviation in the period between the two World Wars.

18. It is one thing to simply note past examples of successful experimentation and innovation. It is equally important, however, to identify the factors that aid in the process of experimentation as well as some of the obstacles that stand in the path of experimentation. There are a number of generalizations that one may suggest as being central to a successful revolution in military affairs. Krepinevich identified the key to success as the "trinity of [the] intellectual, institutional and physical" domains. That trinity should be at the heart of experimentation, and is probably a point that cannot be over-stressed. In his view, experimentation:

- is critical to any effort of transformation or innovation;
- a key part of a process;
- as much philosophical as it is tangible; and

---

12 For a discussion of this see James S. Corum, *The Roots of Blitzkrieg: Hans von Seekt and German Military Reform*, (Lawrence KS.: The University Press of Kansas, 1992.)

13 This is but one example, although by far the most frequently cited, of what was a period of intense military development and innovation. Other examples were the advent of carrier aviation, and strategic bombardment to name but two. See for example, Commander Jan van Tol, "Military Innovation and Carrier Aviation: An Analysis", *Joint Force Quarterly*, Autumn/Winter 1997-98, pp. 97-109; and Williamson Murray and Allan R. Millett (eds.), *Military Innovation in the Interwar Period*, (Cambridge: Cambridge University Press, 1996.)

- must be part of a larger process

19. Williamson Murray and Allan Millett, as well as Stephen Rosen[14], have also addressed not only the factors that contribute to successful innovation and experimentation, but the obstacles and barriers as well. Murray claims that revolutionary innovation "appears largely as a phenomenon of top-down leadership that is well informed about the technical as well as conceptual aspects of possible innovation".[15] He also points out, however, that there have been numerous examples where top-down leadership while certainly present, failed to deliver, citing as a case in point the Royal Air Force and strategic bombing. In this instance "top-down leadership had a disastrous impact on the process of innovation."[16]

20. A second general consideration is that of the military culture in which a revolution or innovation is being contemplated. "One of the most important components of successful innovation during the inter-war period had to do with the ability of officers to use their imaginations in examining potential innovations."[17] Two other influences merit consideration. Both are negative influences that contribute directly to the failure of a revolutionary development. One is the misuse of history. Murray has stated that of the several barriers to innovation, "[p]erhaps the most obvious is a wilful desire to discard history or to twist its lessons to justify current doctrine and beliefs."[18] Another is institutional rigidity. "Rigidity is undoubtedly a fact of life in many military organisations -- one which has exercised a consistent and baleful influence over institutional capacity to innovate."[19]

---

14 Stephen Peter Rosen, Winning the Next War: Innovation and the Modern Military, (Ithaca NY: Cornell University Press, 1991.)

15 Murray, "Innovation: Past and Future", p. 306.

16 Murray, "Innovation: Past and Future", p. 308.

17 Murray, "Innovation: Past and Future", p. 312.

18 Murray, "Innovation: Past and Future", p. 320.

19 Murray, "Innovation: Past and Future", p. 322.

SUMMARY

21. How then, can one balance the understandable difficulties of carrying out a programme of experimentation, against the compelling need to undertake meaningful experiments to aid in innovation? As a first step, there should be a concerted effort to examine and understand the experimentation and innovation imperatives. Only by developing a broad consensus of the value and importance of experimentation and innovation, can the first bridge be crossed. This will be something of a challenge, as it will bring the different perspectives of the *scientific* and *military* cultures into conflict. While this type of conflict can be uncomfortable, it can also lead to a better, more comprehensive result. While the scientific culture is moved to seek the *best* solution, the military culture recognises the need for a *good-enough* solution. By harnessing the inevitable tension between these two characteristics or traits, solutions can be proposed and tested, and recommendations made.

22. A second basic consideration is to devise and put in place a coherent CF futures process. Only then can a programme of experimentation assist in meeting the identified need to develop an innovative force model for an uncertain future. As with the basic need to develop a consensus on the requirement for experimentation, this too will face a number of practical challenges. The most significant of these will be weighing short-term immediate needs, against the more abstract needs of a longer-term nature. Again, this will require achieving an appropriate balance. Just what that balance is, or how it will be achieved is, at this stage, difficult to ascertain. However, there are encouraging signs. The STRATEGY 2020 initiative, coupled with the recent high-level interest in experimentation, is a positive indicator. It is imperative that the momentum of these two activities be maintained and incorporated into a futures process that routinely addresses the future health of the CF. While this may seem something of a contradiction, in that it calls for the institutionalisation of innovation, it is not. What it suggests is that experimentation and innovation should be integrated into larger planning processes. Only then will it be possible for the CF establish long-term objectives, and develop effective plans for how it will achieve those objectives.

DOCUMENT CONTROL DATA
Security classification of title, body of abstract and indexing annotation must be entered when the overall document is classified)

1. ORIGINATOR (the name and address of the organization preparing the document. Organizations for whom the document was prepared e.g. Establishment Sponsoring a contractor's report, or tasking agency, are entered in Section 8).

Operational Research Division
Department of National Defence
Ottawa, Ontario K1A 0K2

2. SECURITY CLASSIFICATION (overall security classification of the document, including special warning terms if applicable)

UNCLASSIFIED

3. TITLE (the complete document title as indicated on the title page. Its classification should be indicated by the appropriate abbreviation (S, C or U) in parentheses after the title)

EXPERIMENTATION AND INNOVATION IN THE CANADIAN FORCES: Some Preliminary Considerations

4. AUTHORS (last name, first name, middle initial)

Robertson, Scot

5. DATE OF PUBLICATION (month Year of Publication of document)	6a. NO OF PAGES (total containing information. Include Annexes, Appendices, etc.)	6b. NO OF REFS (total cited in document)
June 1999		19

7. DESCRIPTIVE NOTES (the category of document, e.g. technical report, technical note or memorandum. If appropriate, enter the type of report e.g. interim, progress, summary, annual or final. Give the inclusive dates when a specific reporting period is covered.)

Research Note

8. SPONSORING ACTIVITY (the name of the department project office or laboratory sponsoring the research and development. Include the address).

Directorate of Defence Analysis

9a. PROJECT OR GRANT NO. (if appropriate, the applicable research and development project or grant number under which the document was written. Please specify whether project or grant.)	9b. CONTRACT NO. (if appropriate, the applicable number under which the document was written.)
N/A	N/A
10a. ORIGINATOR's document number (the official document number by which the document is identified by the originating activity. This number must be unique to this document.)	10b. OTHER DOCUMENT NOS. (Any other numbers which may be assigned this document either by the originator or by the sponsor.)
DOR (J&L) Research Note RN 9905	N/A

11. DOCUMENT AVAILABILITY (any limitations on further dissemination of the document, other than those imposed by security classification.)
- (x) Unlimited distribution
- ( ) Distribution limited to defence departments and defence contractors: further distribution only as approved
- ( ) Distribution limited to defence departments and Canadian defence contractors; further distribution only as approved
- ( ) Distribution limited to government departments and agencies; further distribution only as approved
- ( ) Distribution limited to defence departments; further distribution only as approved
- ( ) Other (please specify):

12. DOCUMENT ANNOUNCEMENT (any limitation to the bibliographic announcement of this document. This will normally correspond to the Document Availability (11). However, where further distribution (beyond the audience specified in 11) is possible, a wider announcement audience may be selected.)

3. ABSTRACT (a brief and factual summary of the document. It may also appear elsewhere in the body of the document itself. It is highly desirable that he abstract of classified documents be unclassified. Each paragraph of the abstract shall begin with an indication of the security classification of the nformation in the paragraph (unless the document itself is unclassified) represented as (S), (C), or (U). It is not necessary to include here abstracts in both fficial languages unless the test is bilingual).

This Research Note provides some preliminary thoughts on the possible requirement for an experimentation and nnovation capability within the Canadian Forces. While the Maritime, Land and Air communities have, to one extent or nother, their own experimentation and innovation facilities, it is clear that a Canadian Forces *purple* or *joint* capability loes not exist. The question remains, then, whether and/or how a CF experimentation and innovation capability can be reated. To address this, it is first necessary to think about the problems attached to military experimentation and nnovation.

4. KEYWORDS, DESCRIPTORS or IDENTIFIERS (technically meaningful terms or short phrases that characterize a document and could be helpful in ataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, ilitary project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus, e.g. Thesaurus of ngineering and Scientific Terms (TEST) and that thesaurus-identified . If it is not possible to select indexing terms which are Unclassified, the classification of ach should be indicated as with the title.)

Military Innovation
Experimentation
Canadian Forces